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Analysis of The Risk of MSDS Occurrence in Female Coconut Peeler Workers

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ABSTRACT

Introduction: Musculoskeletal disorders are pains experienced by individuals in their muscles and skeletons. Awkward postures, static postures, and repetitive movements can all contribute to the development of musculoskeletal disorders. The purpose of this study is to examine the relationship between work posture and musculoskeletal disorders among coconut peeler workers in the village of Sei Apung. **Method:** This is a cross-sectional quantitative study. 52 workers were chosen for this study using a purposive sampling technique. The data were collected using the Rapid Entire Body Assessment (REBA) and Nordic Body Map (NBM) questionnaires.**Result :** This study discovered that the sample characteristics for the age range were dominated by individuals aged > 30 years, totalling 29 individuals (55.8 per cent). This study's respondents were entirely female. With an average work period of one to five years (63.5 per cent), respondents work an average of five hours per day (75 per cent), and respondents' most recent education is dominated by high school graduates or equivalent (76.9 per cent).**Conlusion** As a suggestion for taking a break or stretching muscles, adding hand braces or elbow braces to reduce the risk of complaints, and modifying the seat to reduce the risk of lower back complaints.

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1. INTRODUCTION

Musculoskeletal disorders are conditions that affect the musculoskeletal system, specifically the tendons, muscles, joints, blood vessels, and nerves in the limbs (Health and Safety Executive (HSE), 2015). Postures and repetitive static movements are ergonomic risk factors for the development of musculoskeletal disorders at work.

Musculoskeletal disorders are felt in the muscles and skeleton, and can range in severity from mild to severe. Excessive muscle loading will result in decreased blood circulation to the muscles. Reduced blood flow to the muscles results in a decreased oxygen supply to the muscles, which impairs carbohydrate metabolism. Lactic acid accumulates in the muscles, causing muscle pain (Tarwaka, 2015).

According to the International Labor Organization (ILO), musculoskeletal disorders are the leading cause of compensation costs paid by employers for workers injured or sickened on the job (ILO, 2015). Manual handling, tiring positions, keyboard-related work, and repetitive actions are estimated to be the primary causes of musculoskeletal disorders. MSDS complaints to employees will also result in a reduction in a person's working hours. Around 6.9 million work hours were lost in the workplace due to work-related MSDs in 2019 (Health and Safety Executive (HSE), 2019).

Certain body attitudes and behaviors toward work tools have the potential to result in health problems, if not disease. Working in an incorrect posture can result in a variety of health problems, including pain, fatigue, and even accidents. Additionally, a static work attitude, whether sitting or standing for extended periods of time, can contribute to these issues. This can have a negative effect on either the short or long term (Anies, 2014).

Sumihardi (2015) research on musculoskeletal disorders and their relationship to work attitudes and oil palm harvesters discovered that out of 60 workers, 52 (86.7 per cent) had musculoskeletal complaints. Left/right forearm (86.6 per cent), left/right upper arm (85.5 per cent), waist (85.5 per cent), left/right shoulder (85.5 per cent), and upper neck (83.3 per cent) are the most frequently complained about body parts

According to Bella (2017) research on the relationship between work attitudes and musculoskeletal complaints among Manado seaport workers, 14 respondents (35%) had high-risk work attitudes and common musculoskeletal complaints, 26 respondents (65%) had very high-risk work attitudes and common musculoskeletal complaints, and 14

respondents (35%) had very high-risk work attitudes and common musculoskeletal complaints.

Checking takes its etymological roots in the Javanese word "oncek," which translates as "peeled." The majority of women in Tanjung Balai perform the task of checking or tapping coconuts in order to contribute to the family economy (Yafiz, 2015). Checking is one of the jobs that informal sector workers perform. While the informal sector has made significant contributions to the economy and employment, the health conditions of its workers continue to be concerning(Tjahayuningtyas, 2019)

Sei Apung Village is comprised of nine hamlets with a total population of 4,464 people and covers an area of 10.00 km2. There are 1,098 households in the neighborhood. Male residents outnumbered female residents by a margin of 2,376 to 2,088 in 2019. According to the Sei Apung Health Center's profile in Tanjung Balai sub-district, Asahan district, diseases of the muscle and tissue system were the eighth most prevalent disease in the Sei Apung Health Center's working area in 2017, with 460 cases recorded (*Profil Puskesmas Sei Apung*, 2017). A preliminary survey and brief interview with ten coconut pounding workers using the Nordic Body Map (NBM) questionnaire revealed that eight workers had musculoskeletal complaints in their left upper arm, seven workers had complaints in their right upper arm, and all workers had complaints in their left elbow. There is no such thing as an employee who is never subjected to MSDS complaints.

The working day, based on observations and brief interviews with coconut workers, lasts between 5-8 hours, depending on the quantity of coconuts supplied by the tauke. A cursory examination revealed that the workers continuously rubbed coconuts while seated in a bent position. There is no set rest period, and workers are unaware; when they become tired, they take a brief break because they are chasing a target of kilograms of coconuts. According to worker information, 1 kg of peeled coconut (only the epidermis is removed) costs between 250 and 300 rupiah. The author is interested in researching "the relationship between work attitudes and musculoskeletal disorder complaints among coconut pengoncek workers in Sei Apung Village" based on this description.

2. METHODE

This type of research employs a quantitative approach combined with a survey-analytic technique. This study took a cross-sectional approach, in which data collection and retrieval for independent and dependent variables occurred concurrently. The research sample consisted of 52 individuals selected through a purposive sampling technique. The study lasted from December 2019 to August 2020.

In this study, the independent variable is work attitude. In this study, the independent variable is work attitude. The following variables were examined: age, gender, years of service, length of employment, most recent education, work attitude, and musculoskeletal complaints. The Nordic Body Map (NBM) questionnaire was used to analyze workers' musculoskeletal complaints, and the Rapid Entire Body Assessment (REBA) questionnaire was used to assess the ergonomic risk associated with respondents' work attitudes.

Univariate analysis was used to determine the frequency distribution of work attitudes, complaints of musculoskeletal disorders, and the characteristics of the research sample and to produce the percentage of each variable. Bivariate analysis is a follow-up analysis that uses the Spearman Correlation Test with a significance level of = 0.05 to determine the relationship between the independent variable (work attitude) and the dependent variable (musculoskeletal disorders complaints).

3. RESULT

Table 1. Frequency Distribution of Working Hours for Coconut Peeling Workers

Length of Work (Hours)	Frekuensi	Presentase (%)
< 5 Hours	13	25 %
≥ 5 Hours	39	75 %
Total	52	100 %

Based on the frequency distribution table above, it is known that from 52 respondents, there are 13 people (25%) who work less than 5 hours a day. Moreover, 39 people (75%) work for 5 hours or more in one day. From this data, it can be seen that the frequency of respondents who work more than 5 hours is higher than that of workers who work less than 5 hours.

Table 2. Frequency Distribution of Musculoskeletal Complaint Categories Kategori

Risk Category	Jumlah	Persentase (%)
Lower	12	23,1%
Medium	31	59,6%
High	9	17,3%
Very High	0	0%
Total	52	100 %

Based on the frequency distribution table for the value of musculoskeletal complaints above, it is known that the largest distribution is in the medium category as many as 31 people (59.6%), the low category is 12 people (23.1%), and the lowest in the high category as many as nine people (17, 3 %).

4. DISCUSS

Musculoskeletal disorders are defined as complaints characterized by pain, injury, or abnormalities of the skeletal muscle system, which includes nerve tissue, tendons, ligaments, muscles, and joints (Hasibuan, 2020). Excessive workload, when repeated, can impair concentration, cause decision-making errors, increase the risk of workplace accidents, and have a negative impact on health and work productivity. The workload imposed on the human body must be proportionate to or balanced with the ability or physical capacity of the individual (Mawadi, 2016; Ginanjar, 2018). The majority of musculoskeletal disorders develop gradually. This disorder can be acute or chronic, and it can also be caused by work-related injuries (BM & Dahlan, 2018;Indraswari, 2018) .

The Spearman Rho correlation test results indicated a significance level of p=0.0005. These findings indicate a significant correlation between work attitudes and complaints of musculoskeletal disorders among coconut workers in Sei Apung Village. Correlation coefficient r = 0.534 indicates that this relationship has a strong correlation and a positive pattern. This means that the greater the risk of developing musculoskeletal complaints, the greater the likelihood of developing a negative attitude toward work.

Research of Utari, (2015) show there is a correlation between work attitude and musculoskeletal complaints at the Klumpang Garden Tobacco Sorter, SUTK PTPN II. From a total of 30 respondents, up to 20 had complaints about MSDs in the moderate

category and up to ten had complaints about MSDs in the low category. The findings of this study corroborate those of Arfiasari (2014) regarding workers in the packing department at PT. Djitoe Indonesia. Tobacco demonstrates a moderately strong (r=0.439) and significant relationship between work posture and musculoskeletal complaints, with a p-value of 0.019 and a positive correlation coefficient, indicating that the risk of musculoskeletal complaints increases as the risk level of work postures increases. Research of Amelinda (2017) show the level of non-ergonomic work positions has an effect on workers' musculoskeletal complaints, then the higher the level of non-ergonomic work positions, the higher the musculoskeletal complaints.

Adriansyah (2019) conducted research on Lipa' Sa'be Mandar weaving workers in Karama Village and discovered that 11 people (26.2%) had mild MSDs, 21 people (50%) had moderate MSDs, and ten people (23.8%) had severe MSDs. Butar-Butar (2018) conducted research show Workers with the most pain complaints are concentrated in the waist, numbering up to 26 individuals (86.7%), while workers with no complaints of pain in any body part number up to four individuals (13.3%). According to Widitia (2020) and Suryanto (2020) efforts to prevent MSDS are made by stretching before starting work, eating breakfast before work, and drinking two litres of water per day.

This is caused by incompatible work equipment affecting workers' posture, which in turn affects musculoskeletal complaints. Suwanto (2016) stated the same thing, stating that the results of a study conducted on workers in the iron cutting section at the Pande Besi industrial complex in Padas Klaten revealed there is a significant correlation between the risk of developing musculoskeletal disorder complaints and the risk of developing work posture. Musculoskeletal disorders are a common type of occupational disease.Poor work posture is one of the musculoskeletal complaints. Work posture refers to the position of the body segments while performing tasks. Workers should improve their posture at work, stretch, repair the workplace, and perform technical engineering on work tools, according to this study.

According to this study, the neck position in flexion > 20°, the bent body, the legs, and the upper arms all exhibit significant differences. Meanwhile, during the assessment of work attitude activities, it was discovered that certain body parts, specifically the legs, remained in a static position (fixed posture) for more than one minute. Additionally, there

was repeated activity in a relatively small area > 4 times per minute, specifically when workers placed peeled coconuts and took new coconuts to remove the husks.

The researchers observed workers' work positions, loads, tools used, and repetitive activities prior to calculating work attitude and MSDS complaints. As a result, work attitudes are classified as low-risk or high-risk, whereas all respondents are classified as low-, medium-, or high-risk for MSDS complaints. In this case, the worker stated that he frequently complained of or felt pain in his fingers, shoulders, and back. This data was gathered through in-depth interviews using the Nordic Body Map questionnaire sheet. The majority of respondents reported shoulder, back, and finger pain as a result of repeated activities performed with a less-than-ideal grip and sitting in a bent position for several days without a backrest. Simultaneously, workers must remove and replace the peeled coconut to ensure that the spine rotates freely when the body is bent. Musculoskeletal complaints are caused by the repetitive motion of manually moving goods in a rigid bent body position (Rizka, 2012).

According to Primalia (2019) and Nasution (2020), physical workload has a strong correlation with worker complaints of musculoskeletal disorders. In other words, the greater the workload, the more severe the musculoskeletal disorder complaints experienced by workers. According to Wicaksono, (2016), there is a correlation between work duration and musculoskeletal complaints among students at Diponegoro University's Faculty of Engineering, Department of Architecture. Respondents who work on laptops for more than two hours are 13.5 times more likely to be injured than respondents who work on laptops for less than two hours .

According to Permatasari (2018) show work attitudes correlate with musculoskeletal complaints in-home industry workers in Surabaya; high-risk work attitudes can occur due to poor work station conditions. Another study conducted by Jalajuwita (2015) on workers in the welding unit in 2015 discovered that the majority (62.5 per cent) of workers had musculoskeletal complaints with a moderate level of risk, 25% of workers had low-risk musculoskeletal complaints, 9.4 per cent of workers had high-risk musculoskeletal complaints, and 3.1 per cent of workers had no musculoskeletal complaints.

Even though it can be said as a coconut peeler, the surrounding community and even the local government are more familiar with mentioning the word "mengoncek" than "coconut peeler". Peeling in question is peeling the epidermis of the coconut flesh. The work of checking coconuts is the work done by most women in Tanjung Balai, Asahan

Regency, to help the family economy. The coconut flesh results that have been crushed/peeled can be used as the main raw material for making coconut flour. The working time required by coconut pengoncek varies depending on the amount of coconut that is supplied. The usual working time is around 5-8 hours in one day.

5. CONCLUSIOON

This study discovered that the sample characteristics for the age range were dominated by individuals aged > 30 years, totalling 29 individuals (55.8 per cent). This study's respondents were entirely female. With an average work period of one to five years (63.5 per cent), respondents work an average of five hours per day (75 per cent), and respondents' most recent education is dominated by high school graduates or equivalent (76.9 per cent). Of the 52 respondents, 34 had a high-risk work attitude, and 18 had a medium-risk work attitude. All 52 respondents reported having musculoskeletal complaints, with 12 reporting low-level MSDs, 31 reporting moderate-level MSDs, and nine high-level reporting MSDs.

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